EPA Region I-New England | Center for Environmental Industry & Technology

TECHNOVATION

CURRENT NEWS AND EVENTS ON INNOVATIVE ENVIRONMENTAL TECHNOLOGIES • WINTER 1996/97

Advanced Technology Vehicles — On the Road to Clean Air

Imagine a car that produces no tailpipe air pollution — or a truck that quietly purrs down the highway. Far fetched? Hardly.

Advanced technology vehicles (ATVs), which reduce pollution by use of a new technology and/or alternative fuels, are on the road now. That bus you rode at Logan Airport may have been powered by electricity. That Postal Service truck parked in front of your neighbor's house may be fueled by compressed natural gas. And who knows, the car that went zipping past you may be running on propane.

Motor vehicles — cars, trucks and buses — produce roughly one-half of the air pollution in New England. As population and transportation needs continue to increase, strategies to reduce per vehicle emissions become ever more important in the fight for clean air.

Clean fuel vehicles can reduce per vehicle emissions by up to 80 percent, depending on the type of vehicle and fuel used. Electric vehicles also can reduce noise pollution, due to the elimination of the combustion engine. In addition to reducing pollution, the development and manufacture of ATVs have tremendous potential for new economic development in New England.

As part of our Transportation Initiative, EPA Region I-New England is working with states, private companies, and environmental organizations to increase the availability and use of ATVs throughout the region. In this issue of TECHNOVATION, EPA's Center for Environmental Industry and Technology (CEIT) and EPA transportation specialists have joined forces to bring you some of the latest information on ATV programs and technologies.

For more information on EPA's Transportation Initiative, contact Lucy Edmondson at 617/565-9095, Linda Marinilli at 617/565-9358, or Pete Hagerty at 617/565-3571. If you are interested in having your technology showcased in upcoming issues of TECHNOVATION, please contact Jim Cabot or Carol Kilbride of CEIT at 800-575-CEIT.

Upcoming Events

December 11 - 13, 1996
North American EV & Infrastructure Conference
San Diego, California
Contact: Pam Turner
415/373-0978

December 9 - 11, 1996
North American Motor Vehicle Emissions Control Conference
St. Petersburg, Florida
Contact: Anthony D'Aquila
813/272-5530

Technology Showcase Inside

About CEIT

EPA Region I-New England | Center for Environmental Industry & Technology

New England has always been at the forefront of American technology development and application. Over the last two decades, our entrepreneurs and companies have developed many innovative ideas and technologies that would benefit both the environment and the economy — if they could find their way to the marketplace. To promote New England's environmental technologies and the region's $10 billion environmental industry, EPA Region I-New England established the Center for Environmental Industry and Technology (CEIT). CEIT, developed in coordination with representatives from industry, advances the use of New England technologies by:

- Improving the ability of the industry to gain access to state and federal programs
- Increasing access to technology demonstration sites and testing evaluation
- Increasing access to capital
- Reducing regulatory and institutional barriers facing the environmental industry
- Marketing environmental products and innovative technologies both here and abroad

For more information contact the CEIT at 800/575-CEIT, or write:

Jim Cabot or Carol Kilbride
EPA Region I-New England
JFK Federal Building (SPI)
Boston, MA 02203-0001

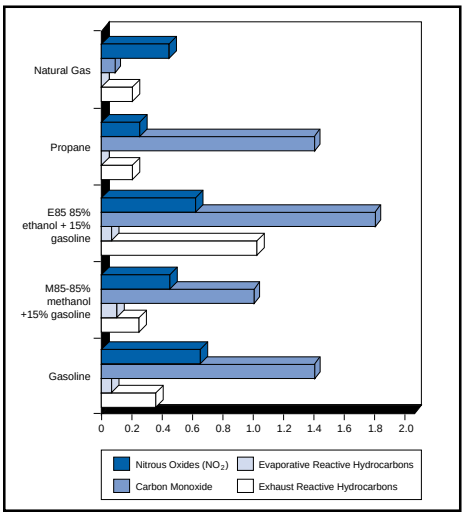
ATV Technology Showcase*

U.S. Postal Service Leads Industry with Deployment of Alternative Fuel Vehicles

Since the energy crisis of the 1970s, the U.S. Postal Service (USPS) has experimented with and promoted the use of alternative fuel vehicles (AFVs). USPS AFVs have used a variety of alternative fuels including:

- Natural gas
- Electricity
- Ethanol (E-85)
- Methanol (M-85)
- Propane
- Hydrogen
- Coal-derived liquid fuels
- Biological fuels (e.g., soy bean, rapeseed, and other vegetable oil-based fuels)

In March of this year, the USPS completed an environmental assessment on alternative fuels which included an evaluation of the most environmentally and economically beneficial fuel for use in a fleet operations. As part of this assessment, USPS established the Alternative Fuels Interagency Task Force, consisting of Federal, state, and regional agencies, as well as private industry, to evaluate the true costs and benefits of the use of alternative fuels.



Graph from USPS study showing that natural gas, overall, produces fewer emissions than other fuels

Natural gas has proven to be the most cost-effective clean fuel to meet USPS needs. Over 6,900 Long Life Vehicles (LLVs) have been converted from the use of gasoline to compressed natural gas (CNG). In the greater Boston Area, the USPS has converted 150 LLVs and two dedicated two-ton dump trucks to CNG. By the end of 1996, the USPS will have over 300 CNG-powered vehicles in the state of Connecticut.

For more information on USPS activity or the Alternative Fuels Interagency Task Force contact:

Ron Robbins, USPS
860 / 285-7197

SatCon Technology, Corp.

SatCon Technology Corporation, based in Cambridge, MA, designs and builds advanced electric motors, flywheels, and power electronics for electric and hybrid-electric vehicles. The company designed and built components for the drivetrain on Chrysler's liquid-natural-gas fueled Patriot race car, a hybrid-electric vehicle. SatCon's motor and electronics are some of the highest energy versions built in the country.

SatCon's technology is also being incorporated into new products being developed for the automotive industry, including improved performance automobile alternators, electric power steering motors, and other electro-mechanical components. SatCon is also developing an improved performance automobile alternator with Delco-Remy America that provides a 50 percent improvement in electrical output within the same basic frame size.

For more information about SatCon contact:

Bill O'Donnell
617 / 349-0846

SCRIMP Systems, L.L.C.

The Seemann Composites Resin Infusion Molding Process (SCRIMP®) is a totally-enclosed molding system that eliminates emissions of volatile organic constituents (VOCs). The SCRIMP® process is being used by TPI, Inc. of Warren, RI as a cost-effective method of producing automotive bodies for electric vehicles. Solectria electric vehicles (featured below) are manufactured with TPI, Inc.'s product line.

SCRIMP®, like resin transfer molding (RTM), produces preformed parts using dry fabrics and cores. Unlike RTM, SCRIMP® uses a one-sided, vacuum tight surface rather than a two-sided high pressure mold or a press. Very thick fabrics, knits, mats, and cores can also be used to speed up the lay-up process.

Since SCRIMP® is completely enclosed, VOCs are trapped in the laminate during the molding process instead of being released into the shop atmosphere. Worker exposure to harmful materials is further reduced, since exposure to wet resins during the lay-up process is completely eliminated.

Highlights

- Virtually eliminates VOC emissions
- Produces void-free, high fiber volume laminates
- Reduces labor, operating, and supply costs
- Reduces worker exposures to wet resins and VOC emissions
- Eliminates cleaning solvents and associated cleaning time
- Speeds up production process — entire laminate is wet in one infusion step, eliminating secondary bonds

**Disclaimer — Mention of any commercial product or process does not constitute endorsement by the U.S. Environmental Protection Agency*

For more information about the SCRIMPΔ process contact:

Jono Billings
401 / 589-2100 (telephone)
401 / 539-8336 (fax)

Solectria Corporation

The Solectria Corporation, based in Wilmington, MA, has produced high-quality electric vehicles (EVs) since 1991. Today, more than 200 Solectria EVs are in service in 36 states and six countries. These zero-emission vehicles have been driven over one million miles in all types of terrain and climates Ûfrom the snowy mountains of Vermont to the Arizona desert. Solectria EVs are also in demand for use in EV demonstration programs for applications ranging from traffic enforcement to commuter vehicles.

Solectria offers three models: two sedans, the Force and the Sunrise, and the E-10 pickup truck. All models offer regenerative braking, shift-free operation, and an onboard battery charger. Solectria batteries can be recharged using a standard household outlet.

Highlights

- Sunrise sedan can complete up to 373 miles on a single charge
- Battery recharge period is a short 3.5 hours
- Meets all requirements of the DOE EV America program and DOT safety standards

For information about Solectria contact:

Karl E. Thidemann
508 / 658-2231 (telephone)
508 / 658-3224 (fax)

Thermo Power Corporation, Tecogen Division

The Tecogen Division of the Thermo Power Corporation has developed a simple economic method for converting a diesel-powered vehicle to dedicated natural gas operation. The system provides current vehicles owners with a low-cost option that does not require the removal of the engine from the vehicle.

The process replaces the camshaft, turbocharger, and intake manifold. The addition of the catalytic converter, spark plugs, fuel metering, and ignition systems completes the conversion. State-of-the-art proven microprocessor engine control, with distributorless ignition, sequential port fuel injection, and closed-loop air-fuel mixture control minimizes exhaust emissions.

Thermo Power?s current development work is centered on the Navistar DTA-466 engine. However, with broad patent protection, and portability of the technology, the system can easily be developed for other engines. The current laboratory development is complete, and an in-house demonstration on a school bus has proven the viability of the technology.

Highlights

- Better fuel economy than competitive technologies
- Power and torque characteristics similar to the diesel version
- Very low exhaust emissions

For more information please contact:

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508 / 624-4662 (fax)
RStakutis@AOL.COM (e-mail)

The Solectria Sunrise sedan combines zero-emission technology with consumer pleasing design

United Parcel Service is the Nation?s Largest Private Fleet Operator of CNG Vehicles

Since the 1930s Ûwhen the United Parcel Service (UPS) began using electric-powered vehicles in New York City Ûthe company has researched and tested alternative fuels to reduce vehicle fuel emissions, the dependency on fossil fuels, and operating costs. Today, UPS operates the nation?s largest private fleet of CNG vehicles, with more than 490 vehicles running in 10 cities across the United States.

Recently, UPS replaced 100 diesel-powered package delivery vehicles in Hartford, CT, with vehicles powered by CNG; in addition, UPS built a CNG fueling station in Hartford. Motivated by recent state legislation offering economic incentives to

Continued on page 5

Government Programs Promote ATV Use

Did You Know That...

The National Vehicle and Fuel Emissions Laboratory (NVFEL) conducts the Federal government's principal program to control air pollution from motor vehicles. The lab's primary responsibilities include:

- Developing regulatory programs to reduce mobile source related air pollution
- Evaluating emission control technologies
- Testing vehicles, engines, and fuels
- Determining compliance with Federal emissions and fuel economy standards

The NVFEL is located in Ann Arbor, Michigan, near the headquarters of domestic automobile manufacturers to facilitate transfer of test vehicles. Several private sector technology centers are also located nearby, making the Ann Arbor area the world center for research on automotive pollution control. For more information contact:

NVFEL
313 / 668-4333 (telephone)

The Partnership for a New Generation of Vehicles

The Partnership for a New Generation of Vehicles (PNGV) is a joint effort between the U.S. Government and the U.S. Council for Automotive Research (USCAR), which represents Chrysler, Ford, and General Motors. The PNGV is focusing research and development efforts on three specific but interrelated goals:

- Improving the productivity of the U.S. manufacturing base by upgrading technology
- Improving vehicle fuel efficiency and reducing emissions, while maintaining or improving safety performance
- Improving fuel efficiency up to three times that of the average 1994 Chrysler Concorde / Ford Taurus / Chevrolet Lumina (with equivalent performance and customer purchase prices adjusted for inflation) within 10 years

Participation in future PNGV programs and projects will be open to suppliers, universities, and others who have potential important and relevant contributions to PNGV goals. For more information about PNGV programs contact:

Government PNGV Secretariat
202 / 482-6260 (telephone)
202 / 482-6275 (fax)

For more information on how to participate in PNGV activities with U.S. automakers and their consortia, contact:

USCAR Secretariat
313 / 248-4296 (telephone)
313 / 248-4303 (fax)

UMass-Lowell Electric Bus

The University of Massachusetts at Lowell (UMass-Lowell) electric bus is the first battery-powered, zero-emission public transportation vehicle in use in New England. Since March 1995, the 22-passenger bus has provided free shuttle service during the school year between the UMass Lowell and Middlesex Community College campuses, and to downtown Lowell and the Gallagher Transportation Terminal in Lowell. The electric bus is operated through a partnership with UMass-Lowell, Massachusetts Electric Company, Lowell Regional Transit Authority, and U.S. Electricar.

The bus is powered by two 25 horsepower DC motors using energy from rechargeable deep-discharge batteries. The top speed of the bus is approximately 30 miles per hour, with a range of 35 miles. The battery packs are changed as needed in a 15-minute exchange operation.

One of the first battery-powered buses to operate in a cold climate, the UMass electric bus allows University faculty and students to study the

The UMass-Lowell electric bus has been providing zero-emission transportation to students since March 1995

feasibility and efficiency of non-air-polluting, non-oil-consuming systems. Faculty and students have already designed a non-polluting heating system for the bus and installed a photovoltaic panel on the bus? roof that provides supplemental power. Plans are underway for a solar garage / charging station that will eventually provide almost all of the energy for the bus.

The electric bus was used at Logan Airport this summer along with other AFVs as part of the Clean Air Partners Program discussed below.

Highlights

- Uses clean electricity as a fuel Û produces no tailpipe air pollution
- Reduces noise pollution
- Uses efficient and cost-effective solar power Ûeventually batteries will be recharged solely by solar
- Reduces fuel and maintenance costs

For more information contact:

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duffyj@woods.uml.edu (e-mail)

Clean Air Program Takes Off from Logan Airport

Anyone passing through Logan Airport recently may have noticed a change in the air thanks to the Clean Air Partners, who are making the gateway to New England an international showcase of how airports can improve air quality through the use of new ATVs and technologies.

The Clean Air Partners, an alliance of public agencies and private companies, are making clean air a priority at Logan. Massport, the NEES companies, and Boston Edison Company joined EPA, Region I-New England to launch an armada of clean fuel vehicles at the airport and to support their use with a clean air public service campaign. Elements of the effort include:

Members of the ÏClean Air PartnersÓinitiative at the Logan Airport kickoff, from left are: Jim Marcotte, Thrifty Car Rental; James Kerasiotes, Secretary, MA EOTC; Jeff Tranen, the NEES Companies; John DeVillars, Regional Administrator, EPA-New England; Carl Gustin, Boston Edison Company

- The Dollar, Thrifty, and National rental car companies have agreed to operate a portion of their shuttle bus fleet on clean fuel. They will begin operating CNG-powered shuttle buses between the airport terminals and the rental car offices at the airport
- New England?s first electric taxi is making runs from the airport to downtown Boston
- An electric shuttle bus joined the fleet of Massport shuttle buses operating at Logan this summer (see related story)
- An Airport Water Shuttle, powered by a new clean fuel Û biodiesel Ûfor its regular runs from Rowes Wharf to the airport
- A Massport CNG bus, wrapped in a vinyl fabric carrying the public service campaign message, ÏThere?s a change in the airÓ

For more information on the project contact one of the transportation specialists at EPA Region I-New England:

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617 / 565-3571

UPS, *continued from page 3*

private fleet operators that use alternative fuels like CNG, UPS plans to build on its million-dollar Hartford initiative by expanding its alternative fuels program with 100 additional vehicles scheduled to be converted to CNG by the end of 1996.

Highlights

- UPS operates more than 490 CNG vehicles across the United States
- CNG vehicles produce 75 percent less smog-causing pollutants than diesel
- Use of CNG vehicles reduces operating costs Ûan equivalent gallon of natural gas can cost less than half the standard fuel purchase, excluding taxes

For more information on UPS? CNG program contact:

Joel Williams
Edelman Public Relations
312 / 240-2731

For More Information on ATVs Contact

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